NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

COVER CROP

(acre)

CODE 340

DEFINITION

Grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes.

PURPOSES

- Reduce erosion from wind and water
- Increase soil organic matter
- Manage excess nutrients in the soil profile
- Promote biological nitrogen fixation
- Increase biodiversity
- Weed suppression
- Provide supplemental forage

CONDITIONS WHERE PRACTICE APPLIES

On all lands requiring vegetative cover for natural resource protection

CRITERIA

General Criteria Applicable To All Purposes

Based upon purpose, select plant species and site management from Appendix 1 for cropland, and Appendix 2 for orchards, vineyards and nursery cover. For development sites, refer to Critical Area Planting standard.

The species selected will be compatible with the nutrient management and pest management provisions of the plan. Maintain soil pH 6.0 to 7.0.

Cover crops will be terminated by harvest, frost, mowing, tillage, and/or herbicides in preparation for the following crop.

Herbicides used with cover crops will be compatible with the following crop

Cover crop residue will not be burned

Additional Criteria to Reduce Erosion From Wind and Water

The amount of surface and/or canopy cover needed from the cover crop shall be determined using current erosion prediction technology.

Additional Criteria to Promote Biological Nitrogen Fixation

The seed will be inoculated at the time of planting legumes with the specific Rhizobia bacteria.

Nitrogen credits from legume cover crops will be accounted for in the nutrient management plan.

Additional Criteria to Manage Excess Nutrients in the Soil Profile

The aboveground biomass will be removed from the field for nutrient removal purposes.

Additional Criteria to Increase Soil Organic Matter

The equivalent of at least 1 ton of dry matter per acre must be returned to the soil to improve organic matter. Turn under about 2 weeks before planting succeeding crop.

Additional Criteria to Increase Bio-diversity

Cover crop species shall be selected that, have different maturity dates, attract beneficial insects, serve as a trap crop for damaging insects, and/or provide food and cover for wildlife habitat management.

Additional Criteria for Weed Suppression

Species for the cover crop will be selected for their chemical or physical competition with weeds.

Cover crops residues will be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects.

For long-term weed suppression, perennials and/or biennial species can be used.

Additional Criteria to Provide Supplemental Forage

Forage provided by the cover crop may be hayed or grazed as long as sufficient biomass is left for erosion control.+

CONSIDERATIONS

Deep-rooted species provide maximum nutrient recovery.

Consider that grasses utilize more soil nitrogen, and legumes utilize both nitrogen and phosphorus.

Acceptable benefits are accomplished when the combined canopy and surface cover is at least 60 percent.

Cover crops may be used to improve site conditions for establishment of perennial species.

Broadcasting of seed produces more uniform cover.

Consider potential herbicide carryover when selecting the species of the cover/green manure crop. Plan the use of herbicides that will not restrict the use of the planned cover crop.

Grass cover/green manure crops (especially cereal rye) are more effective in utilizing excess nitrogen remaining from the previous crop.

Cereal rye will grow longer in the fall and begin growth earlier in the spring than wheat.

Grass type cover/green manure crops should be considered when a legume crop, e.g. soybeans, is planned following the cover crop.

Legume type cover/green manure crops should be considered when a grass crop, e.g. corn, is planned following the cover crop.

It is critical that grass cover/green manure crops be controlled or killed when planting a grass crop such as corn. Grass cover crops, especially cereal rye, can produce an allelopathic effect that can slow the germination and growth of corn and other grass crops/weeds. It is best to kill the grass cover about a week prior to planting the corn crop.

Aerial seeded and early no-till established cover crops provide more erosion control the year of establishment.

Cover crops established after considerable soil disturbance in the fall or seeded after October 15th can cause more erosion during the year of establishment than if no cover crops were planted.

Cover crops should be considered on fields following corn silage to reduce erosion and to replace organic matter losses.

Cover crops following corn silage or soybeans generally provide most of their erosion protection the spring (year) after establishment when allowed to mature to the heights specified in the criteria. No till and mulch till systems compliment the use of cover crops.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. The State standard will specify practice requirements for the following species:

*Seeding rates and dates

*Establishment methods

*Soil amendments needed

*O&M requirements

Specifications can be recorded in narrative format, on job sheets, or forms designed to provide specific requirements for the practice.

OPERATION AND MAINTENANCE

Control growth of the cover crop to reduce competition from volunteer plants and shading.

Control weeds in the cover crop by mowing or herbicide application.

Mowing requirements for permanent cover.

Herbicide or tillage operation to surpress cover crop before planting of row crop.

Soil test requirements.

Approximate forage harvest height and date.

REFERENCE

Agronomy Guide. The Pennsylvania State University, College of Agriculture-Extension Service, University Park Pa. (http://AgGuide.agronomy.psu.edu)

Appropriate Technology Transfer for Rural Areas (ATTRA), Fayetteville, AK. (http://www.attra.org)

Cover Crop 1999. Field Office Technical Guide, USDA-NRCS, Columbus, OH.

APPENDIX 1
Benefits

					Nutrient Removal					
Specie	Rates	Seeding Dates	Erosion Control	N Fixation (lbs/ac)	N (lbs)	P2O5 (lbs)	Organic Matter	Biodiversity	Weed Supression	Forage
Wheat	2bu	August 15-October 15	X		X		X		X	X
Cereal Rye	2bu/ac	August 15-October 15	X		X		X	X	X	X
Spring Oats	2bu	August 15-October 15	X		X		X		X	X
Annual Ryegrass	30lbs	August 15-October 15	X		X	X (-15/T)	X		X	X
Hairy Vetch	30lbs	August 15-September 15	X	X (+100)				X	X	X
Crownvetch	5-20lbs	April 15-May 15	X	X (+50)					X	X
Birdsfoot Trefoil	10lbs	April 15-May 15	X	X (+40)		X	X	X	X	X
Crimson Clover	20lbs	March 15-April 15 & August 15-September 15	X	X (+100)		X (-15/T)	X		X	X
Red Clover	15lbs	March 15-April 15 & August 15-September 15	X	X (+100)		X (-15/T)	X	X	X	X
White Clover	12lbs	March 15-April 15 & August 15-September 15	X	X (+100)		X (-15/T)	X	X	X	X
Ryegrass	40lbs	March 15-April 15 & August 15-September 15	X		X	X	X		X	X
Bluegrass	40lbs	March 15-April 15 & August 15-September 15	X		X	X	X		X	X
Smooth Bromegrass	40lbs	March 15-April 15 & August 15-September 15	X		X	X	X		X	X
Orchardgrass	40lbs	March 15-April 15 & August 15-September 15	X		X	X	X		X	X
Timothy	40lbs	March 15-April 15 & August 15-September 15	X		X	X	X		X	X

APPENDIX 2

Mixtures for Orchard, Vineyard and Nursery Crop

Mixture	Rate (ac)	Seeding Date
Annual Ryegrass	20lbs	August 15-October 15
Rye	1bu	August 15-September 15
Hairy Vetch	20lbs	
Rye	2bu	August 15-October 15
Bromegrass	20lbs	August 15-September 15
Orchardgrass	8lbs	March 15-April 15
Ladino Clover	2lbs	August 15-September 15
Wheat	2bu	August 15-October 15
Bluegrass	8lbs	March 15-April 15
Timothy	4lbs	August 15-September 15
Bluegrass	8lbs	March 15-April 15
Ladino Clover	2lbs	August 15-September 15